

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Progress towards an *ab initio* real-time treatment of warm dense matter ANDREW BACZEWSKI, ATTILA CANGI, STEPHANIE HANSEN, DANIEL JENSEN, Sandia National Laboratories — Time-dependent density functional theory (TDDFT) provides an accurate description of equilibrium properties of warm dense matter, such as the dynamic structure factor (Baczewski, *et al.*, Phys. Rev. Lett., 116(11), 2016). While non-equilibrium properties, such as stopping power, have also been demonstrated to be within the grasp of TDDFT, the ultrafast isochoric heating of condensed matter into the warm dense state, enabled by recent advances in XFELs, remains beyond its capabilities. In this talk, we will describe the successes of and continuing challenges for TDDFT for warm dense matter, and present progress towards a more complete *ab initio* treatment of isochoric x-ray heating. Sandia National Laboratories is a multi-mission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International, Inc., for the DOE's National Nuclear Security Administration under contract DE-NA0003525.

Andrew Baczewski
Sandia National Laboratories

Date submitted: 12 Jul 2017

Electronic form version 1.4